To: Gullett, Brian[Gullett.Brian@epa.gov]
Cc: Chirayath, Ved (ARC-SGE)[ved.chirayath@nasa.gov]; Kim, Nicole Y[kim.nicoley@epa.gov]; Aurell, Johanna[Aurell.Johanna@epa.gov]
From: Jonsson, Jonas (ARC-TI)[SGT, INC]
Sent: Wed 5/24/2017 2:38:30 AM
Subject: RE: Figures in paper
Kolibri Matrice Flight Paths v3.pptx

Hi Brian,

I have been working on the data sets when I get some time over, which is scarce so apologize for the delay. I have two issues with the plotting of the data.

First, attached is the ppt with an added slide with the corresponding views for the McAlester flight. However, there are some differences between the original (plotted using the M600 GPS data) and the new (plotted using the sensor GPS data). It almost looks like its a different flight, but the date is correct and the two other flight GPS tracks seems to roughly correspond to the other two burn GPS tracks. Its also easier to do the comparison on the ground track than the airborne track. The main differences are that the inbound and outbound tracks differ in altitude more, and the top/farthest part of the track is "missing", on the sensor data plot. Don't remember, but how was the sensor GPS mounted? Maybe it experienced some interference?

Second, the excel file you sent me for the Radford flights does not contain any GPS (Lat., Long., or Alt.) information, only timestamps and the sensor readings. The data file from McAlester you sent me earlier had all these data in it and that's what I used to plot the tracks with the sensor readings in them. I tried to look at using the GPS data from the vehicle, but the time stamps do not agree.

The sensor data time stamps

Burn #1 is 9:28 to 9:40

Burn #2 is 9:42 to 9:55

Burn #3 is 10:32 to 10:47

The flight log time stamps

Flight #1 is 9:34 to 9:42

Flight #2 is 9:47 to 9:58

Flight #3 is 10:40 to 10:53

The data I used for plotting was for Flight 2 (9:47 start time). That would correspond to Burn 2 data, but looking at that data the first spike in CO measurement is on line 124 at time stamp 9:44. That is about 3 minutes before the flight log starts, and same goes with the other two data sets. So the time stamps between the vehicle logs and sensor logs seems not to be synched.

In addition, there are around 700 data points from the sensor and around 7000 data points from the vehicle, so even if the time was synched it would be a bit of an effort to merge these two data sets.

The best would be if you have the CO measurements with the gps data like you had for McAlester.

(FYI I'll be offline May 27-June 11, off to Svalbard)

Let me know what you think,
Jonas

From: Gullett, Brian [mailto:Gullett.Brian@epa.gov]
Sent: Thursday, May 18, 2017 8:53 AM
To: Jonsson, Jonas (ARC-TI)[SGT, INC]
Cc: Chirayath, Ved (ARC-SGE); Kim, Nicole Y; Aurell, Johanna
Subject: RE: Figures in paper

Jonas,

Here are the data from Radford, October 6. There are data here for three burns. I'm not sure which flight you included in the graph.

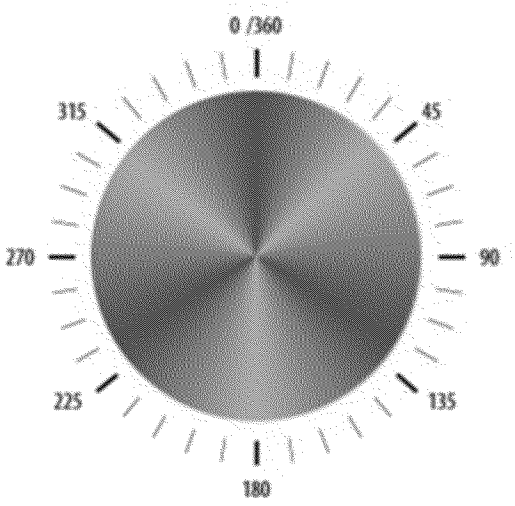
Thanks for your help!

Brian

From: Jonsson, Jonas (ARC-TI)[SGT, INC] [mailto:jonas.jonsson@nasa.gov]
Sent: Thursday, May 18, 2017 2:15 AM
To: Gullett, Brian <Gullett.Brian@epa.gov>
Cc: Chirayath, Ved (ARC-SGE) <ved.chirayath@nasa.gov>; Kim, Nicole Y <kim.nicoley@epa.gov>; Aurell, Johanna <Aurell.Johanna@epa.gov>
Subject: Re: Figures in paper

Brian,

The blue is due to the scale that is being used for coloring the track, see image attached. I had to rescale the data values to fit the scale and had it go from 90 to 360, which includes blue. I've refitted in inverted the scale for the data to go from 90 (green) for low values to 0 (red) for the high values (passing through yellow and orange).



Brian, can you please send me the CO2 data from Radford, I only have the data from that day (yes, three flights) in McAlester that I plotted. I will break out the data for the particular flight we are focusing on and will plot for the views in the "old" images.

Jonas

Jonas Jonsson, PhD
ISRDS-2 AOS for UAS Task Lead
SGT Inc. Research Engineer
NASA Ames Research Center
Mail Stop 202-3
Moffett Field, CA 94035
Office: 650-604-4774

On May 17, 2017, at 6:43 AM, Gullett, Brian <Gullett.Brian@epa.gov> wrote:

Hej, Jonas. Tack sa mycket.

This looks pretty good and is similar to what Nicole (here at EPA) came up with.

You are actually showing three distinct flights, I believe. I think for the purpose of illustrating what the UAS can do, we can show a single flight with color-coded CO2 concentrations. I'm sure we'll be able to substitute revised figures when we respond to the reviewers' comments.

What is the blue color? Perhaps if you can alter the color spectrum to green – yellow-orange- red that will be best?

If it's okay with Ved, can you redo the Radford and McAlester figures, including the tables with CO2 concentration and the color-coded CO2 levels? Include top and side views as you think it looks best.

Thanks!

Brian

From: Jonsson, Jonas (ARC-TI)[SGT, INC] [mailto:jonas.jonsson@nasa.gov]
Sent: Wednesday, May 17, 2017 9:29 AM

To: Gullett, Brian <Gullett.Brian@epa.gov>
Cc: Chirayath, Ved (ARC-SGE) <ved.chirayath@nasa.gov>
Subject: Re: Figures in paper

Hi Brian,

I was going to send this image last night, but it got pretty late and I fell asleep before I managed to get it out to you.

I have played around with this for a while in-between work and other commitments, sorry for the delay, and think I have figured something out. I had to reformat and normalize the data and write my own KML, but attached is a screenshot from the data file that you sent me earlier. This displays the three flights we did on Feb 13th, with the CO2 plotted along the track line. I can format the lines in the image somewhat, and this is what I could come up with now as a best visualization. Let me know what you think and I can try edit it as needed.

I've seen that you submitted the paper already, but maybe they are willing to receive the updated graphics if we would want to replace the ones we already have in the paper (don't know if they have picked out the reviewers yet)?

Trying to figure out this I overlooked to reply to the other questions you had:

The data I used for the plots in the paper are:

Radford: DJIFlightRecord_2016-10-06_[09-47-44].txt

McAlester: DJIFlightRecord_2017-02-13_[09-31-51].txt

(see email from Apr 10, 2017, at 12:47 PM)

And I used Google Earth.

Let me know what you think.

-Jonas

<image001.jpg>

Jonas Jonsson, PhD
ISRDS-2 AOS for UAS Task Lead
SGT Inc. Research Engineer
NASA Ames Research Center
Mail Stop 202-3
Moffett Field, CA 94035
Office: 650-604-4774

On May 10, 2017, at 7:15 AM, Gullett, Brian <Gullett.Brian@epa.gov> wrote:

Jonas,

Would it be possible for you to add the CO2 concentrations to the red line in Figures 2 and 3?

Can you identify which flight paths these are (or the filename) for both figures? -- I don't recall….

My colleague here was able to use Google Earth to add the colors for CO2 (see attached jpg) but I like your figure better…did you use Google Earth or ArcGIS?

I am hoping to get these last changes done and submit the paper tomorrow.

Thanks!

Brian

Brian K. Gullett, Ph.D.

U.S. Environmental Protection Agency

Office of Research and Development

National Risk Management Research Laboratory

E343-04

Research Triangle Park, NC 27711

gullett.brian@epa.gov

919-541-1534 Ofc

919-699-3074 Cell

<Kolibri Matrice paper May 10 post DM JB JR QA.docx><McAlester_Flight3_2.jpg>